

Remarks

Claims 63-100 were pending in the subject application. By this Amendment, claims 63, 73, 87, and 89 have been amended. The undersigned avers that no new matter is introduced by this amendment. Entry and consideration of the amendments presented herein is respectfully requested. Accordingly, claims 63-100 are currently before the Examiner for consideration. Favorable consideration of the pending claims is respectfully requested.

The applicant and the applicant's representative wish to thank Examiner Belyavskyi for the courtesy of the telephonic interview conducted with the undersigned and Dr. Beerelli Seshi, the inventor of the claimed subject matter, on September 23, 2004, regarding the rejections under 35 U.S.C. §102. The remarks and amendments set forth herein are consistent with the substance of the interview and are believed to address the outstanding issues as discussed during the interview.

As a preliminary matter, the applicant notes that the supplemental Information Disclosure Statement (IDS) submitted on May 4, 2004 was not acknowledged in the instant Office Action. The applicant reviewed the status of the subject application on the U.S. Patent Office's Patent Application Information Retrieval (PAIR) system and found that the Patent Office has received the supplemental IDS. The applicant respectfully requests that the Examiner consider the reference listed on the Form PTO/SB/08 and make its consideration of record in the subject application.

By this Amendment, the applicant has amended claims 63, 73, 87, and 89 to recite that the plurality of genes that are markers for multiple cell lineages are simultaneously expressed at the protein level. Support for this amendment can be found, for example, at pages 12-16 and pages 27-29 (*e.g.*, Table 1), of the specification, which describe immunocytochemical characterization of the cells of the invention. Immunocytochemistry is a well known technique for detecting the presence of specific proteins in cultured cells.

The applicant gratefully acknowledges the Examiner's withdrawal of the rejections under 35 U.S.C. §112, first and second paragraphs, 35 U.S.C. §103, and 35 U.S.C. §102(b) (over U.S. Patent No. 5,879,940).

The Examiner has objected to the specification of the subject application for containing an embedded hyperlink. By this Amendment, the embedded hyperlinks have been deleted from the subject specification. Reconsideration and withdrawal of the objection is respectfully requested.

Claims 63-100 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Caplan *et al.* (U.S. Patent No. 5,226,914) or Caplan *et al.* (U.S. Patent No. 5,811,094), each as evidenced by the Dictionary of Cell Biology (1989, p. 189). The applicant respectfully submits that the cited references do not teach or suggest the cells and compositions of the claimed invention.

Claims 63-100, as currently amended, recite that the pluri-differentiated mesenchymal progenitor cell simultaneously expresses, at the protein level, a plurality of genes that are markers for multiple cell lineages, wherein each of the markers is specific for a single cell lineage. The pluripotent mesenchymal stem cells, lineage-committed progenitors, and terminally differentiated mesenchymal cells of the '914 and '094 patents do not simultaneously express the recited genes.

The applicant respectfully submits that the Office Action does not establish that the pluri-differentiated cell of the invention and the pluripotent cells of the cited patents are identical or substantially identical, or obtained by an identical or substantially identical process, in accordance with the precepts of *In re Best*, 195 USPQ 430, 433 (C.C.P.A. 1977) and MPEP § 2112.01. The '914 patent and '094 patent each describe pluripotent mesenchymal stem cells isolated from the Friedenstein culture system, which are distinct from the cells of the claimed invention that are obtainable using the Dexter culture system. As indicated at page 12, lines 4-7, of the subject specification, cells that are pluripotent or have "pluri-potential" are undifferentiated cells having the potential to differentiate into discrete mesenchymal tissues. This is consistent with the definition of "pluripotent stem cells" stated in the Dictionary of Cell Biology cited at page 4 of the Office Action, *i.e.*, "capable of differentiating into several final differentiated types" (emphasis added). Furthermore, submitted herewith is a copy of *Stem Cells: Scientific Progress and Future Research Directions*, Department of Health and Human Services, Executive Summary, Chapters 1-11, and Appendices A-G, June 2001, for the Examiner's consideration. As indicated at page ES-2, second column, "differentiation is the process by which an unspecialized cell (such as a stem cell) becomes specialized into one of the many cells that make up the body" (emphasis added).

In contrast, the “pluri-differentiated” cell of the subject invention is one that co-expresses genes specific for multiple mesenchymal cell lineages. As indicated at page 13, lines 25-31, of the subject specification, and as recited in the claims, these genes are expressed simultaneously. Thus, “using a variety of techniques, applicant has demonstrated that the MPCs co-express multilineage mesenchymal cell phenotypes, and in this respect the multi- or pluri-differentiated MPCs are distinct from the pluri-potential, but undifferentiated, MSCs of Friedenstein cultures ...”, as stated at page 16, lines 3-7, of the specification. Thus, pluripotent cells and pluri-differentiated cells are not equivalents. This is consistent with statements made throughout the ‘914 and ‘094 patents.

The ‘914 patent states that “the marrow-derived mesenchymal cells are the formative pluripotential blast cells found in the bone that are believed to be capable of differentiating into any of the specific types of connective tissues (i.e., the tissues of the body that support the specialized elements; particularly adipose, areolar, osseous, cartilaginous, elastic, and fibrous connective tissues) depending upon various environmental influences” (see column 1, lines 14-21); that the cells “have the ability to generate into several different types of cell lines (i.e., osteocytes, chondocytes, adipocytes, etc.) upon activation” (see column 3, lines 68, to column 4, line 2); that the cells are “capable of differentiating into an assortment of connective tissues depending upon the influence of a number of bioactive factors” (see column 4, lines 7-9); and that the isolated and culturally expanded marrow-derived mesenchymal cells can be utilized under certain specific conditions and/or under the influence of certain factors, to differentiate and produce the desired cell phenotype”. The ‘914 patent merely states that marrow-derived mesenchymal cells can be harvested, grown in an undifferentiated state through mitotic expansion in a specific medium, and activated to differentiate into various types of cells (such as osteoblasts, adipocytes, and fibroblasts) by a number of factors, including mechanical, cellular, and biochemical stimuli (see column 3, lines 21-40). Thus, for example, the ‘914 and ‘094 patents do not demonstrate or suggest that the marrow-derived mesenchymal cell can be induced to differentiate into a cell that simultaneously exhibits the phenotypes of the various differentiated mesenchymal cell types. Likewise, the ‘914 and ‘094 patents do not demonstrate or suggest that the marrow-derived mesenchymal cell can be induced to simultaneously express a plurality of genes that are specific markers for at least four different mesenchymal cell lineages, such

as adipocytes, osteoblasts, fibroblasts, and muscle cells, as is recited in claims 63, 64, 73, 74, 87, and 89, of the subject application.

It is well settled in patent law that, in order to anticipate under 35 U.S.C. §102, a single reference must disclose within the four corners of the document each and every element and limitation contained in the rejected claims. *Scripps Clinic & Research Foundation v. Genentech Inc.*, 18 USPQ 2d 1001, 1010 (Fed. Cir. 1991). Simultaneous expression of the types of markers recited in the claims of the subject application is not disclosed in the cited references.

At page 4, the Office Action indicates that “the claimed functional limitation would be inherent properties of the referenced cell and the pharmaceutical composition comprising said cells ...”. The applicant respectfully submits that when an Examiner relies upon a theory of inherency, “the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” *Ex Parte Levy*, 17 USPQ2d 1461, 1464 (BPAI 1990). Here, the Examiner asserts “because the reference cells are the same cells, i.e. human mesenchymal progenitor cell that were obtained from the same sources as claimed cells”. Although the applicant acknowledges that the cells of the claimed invention and the cells of the cited references were both obtained from bone marrow, this is insufficient to support the conclusion that they are the same cell. There are several cell types in bone marrow including, but not limited to, hematopoietic stem cells, mesenchymal stem cells, natural killer (NK) cells, lymphoid progenitor cells, T lymphocytes, B lymphocytes, neutrophils, basophils, eosinophils, monocytes/macrophages, platelets, red blood cells, osteoblasts, and adipocytes. Furthermore, even if the cells of the subject invention originate from the same cell population or cell type as those of the ‘914 and ‘094 patents, the applicant respectfully submits that the cells of the invention are novel and non-obvious over the cited reference because the cells of the invention exhibit a novel and non-obvious characteristic that is not only not disclosed by the cells of the ‘914 and ‘094 patents, but is also not possessed by these cells under the conditions tested.

As the Examiner is undoubtedly aware, inherency may not be established by probabilities or possibilities regarding what may have resulted in the prior art. *In re Oelrich*, 212 USPQ 323, 326 (CCPA 1981). “The mere fact that a certain thing may result from a given set of circumstances is not sufficient.” *Hansgird v. Kemmer*, 40 USPQ 665, 667 (CCPA 1939).

The Office Action indicates that the applicant has the burden to show that the referenced cell does not have the same functional limitation as recited in the claims of the subject application. However, initially, it is the Examiner's burden of providing factual evidence and/or technical reasoning to support the determination of inherency. See *In re Spada*, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990); *In re King*, 231 USPQ 131, 138-139 (Fed. Cir. 1986). The applicant respectfully submits that the Examiner has not met this burden. The applicant respectfully submits that the presence of inherent matter must be grounded on more than speculation, it must be a certainty. *Ethyl Molded Product Co. v. Betts Package Inc.*, 9 USPQ 2d 1001, 1032-1033 (I.D.KY 1988) ("the doctrine of inherency is available only when the prior inherent event can be established as a certainty. That an event may result from a given set of circumstances is not sufficient to establish anticipation" (emphasis added)). Furthermore, when the reference is silent about the asserted inherent characteristic, while such a gap in the reference may be filled with recourse to extrinsic evidence, the extrinsic evidence

must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill in the art. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient. *In re Robertson*, 49 USPQ 2d 1949, 1950-1951 (Fed. Cir. 1999).

There is no teaching in the '914 and '094 patents, nor has the Examiner shown, that it is a certainty that the pluripotent mesenchymal cells or their lineage-committed progeny simultaneously express a plurality of genes that are markers for multiple cell lineages comprising at least four different mesenchymal cell lineages (such as adipocyte, osteoblast, fibroblast, or muscle cell), wherein each of the markers is specific for a single cell lineage. In alleging inherency, the Examiner merely relies on a definition of the term "pluripotent" within the Dictionary of Cell Biology and the fact that the cells of the subject invention and cited references were both obtained from bone marrow. The applicant respectfully submits that the dictionary definition of "pluripotent" provided with the Office Action, which is the only extrinsic evidence provided by the Examiner, is consistent with its use in the specification, and the specification clearly distinguishes "pluripotent" cells from "pluri-differentiated" cells. As indicated above, there are many cell types resident in bone marrow. Thus, the fact that the cell of the invention was obtained from a common source of tissue as the cells

of the '914 and '094 patents is not a basis in fact or technical reasoning that reasonably supports the determination that the cells of the cited patents simultaneously express the recited markers, particularly in view of the fact that the cell of the invention was isolated from bone marrow by a different process than the cells of the cited patents, as the Examiner acknowledges at page 4 of the Office Action. Because the Examiner has not shown that the allegedly inherent characteristic (simultaneous expression of the recited mesenchymal cell lineage-specific markers) necessarily flows from the teachings of the '914 and '094 patents, the applicant respectfully submits that the cited references do not anticipate the claimed invention.

The '914 and '094 patents describe pluripotent marrow-derived mesenchymal stem cells, which can be expanded in a specific culture medium (so called "complete medium") allowing growth without differentiation. Because the mesenchymal cells are pluripotent, they can then be induced to differentiate into discrete mesenchymal cell types by exposing the cells to lineage-specific conditions (*i.e.*, conditions that are favorable to adipogenic, chondrogenic, or osteogenic differentiation), culminating in a terminally differentiated mesenchymal cell type. For example, the '914 and '094 patents indicate the culturally expanded mesenchymal cells have the ability to differentiate into bone when incubated as a graft in porous calcium phosphate ceramics (see column 8, lines 21-32; column 13, lines 30-40; and column 14, lines 9-13, of the '914 patent and column 23, lines 37-41 of the '094 patent). The '094 patent indicates that dexamethasone induces the mesenchymal cells to differentiate into osteoblasts (column 45, lines 33-34) and that OS medium causes the cells to differentiate and express osteogenic characteristics such as alkaline phosphatase (column 38, lines 45-47). Pages D2-D4 of *Stem Cells: Scientific Progress and Future Research Directions* is a table listing published reports of mouse mesenchymal stem cells and differentiation conditions that have been utilized to obtain a variety of discrete cell types, including mesenchymal and other cell types.

The applicant notes that the '094 patent is a continuation-in-part application claiming priority to the '914 patent. The '094 patent further characterizes the isolated, culture-expanded pluripotent mesenchymal cells of the '914 patent (see Example 4, columns 37-39 of the '094 patent). Immunological assays were used to probe for molecules synthesized and deposited by pluripotent mesenchymal cells into the cell membrane and extracellular matrix (ECM), or secreted as soluble

factors into the culture medium, the results of which are shown in Table 5 at columns 38 and 39 of the '094 patent. The '094 patent states:

Epitopes to markers that identify differentiated mesenchymal phenotypes are not detected by our analysis including those synthesized by chondrocytes (type II collagen, keratin sulfate (KS), osteoblasts (Bone Graft Protein (BGP)), basement membrane fibroblasts (laminin, elastin and type IV collagen, marrow stromal cell progenitors (Stro-1 antigen), and endothelial cells (von Willebrand factor) ... This pattern of expression is clearly distinct from the patterns of collagen expression by osteoblasts or chondrocytes, and should prove useful in revealing developmental transitions along these lineage pathways ... The data show that MSCs display a set of macromolecules that is distinct from those associated with differentiated mesenchymal cell types including osteoblasts, chondrocytes, and marrow stromocytes (emphasis added). Column 39, lines 13-44.

Thus, the pluripotent mesenchymal cells of the cited references do not simultaneously express the diverse mesenchymal-specific markers recited in the claims of the subject application. Rather, the phenotype of the pluripotent mesenchymal cell is distinct from its progeny, which are lineage-committed and differentiated osteoblasts, chondrocytes, and differentiated cells of the marrow stroma (stromocytes), as indicated at column 38, lines 5-9, of the '094 patent. In contrast, as taught at pages 27-32 of the specification, the pluri-differentiated mesenchymal progenitor cells of the subject invention simultaneously express a plurality of genes that are markers for multiple cell lineages comprising at least four different mesenchymal-specific cell lineages, such as adipocyte (*e.g.*, fats as determined by Nile Red and Oil Red O), osteoblast (*e.g.*, alkaline phosphatase), fibroblast (*e.g.*, fibronectin, prolyl-4-hydroxylase), and muscle cells (*e.g.*, muscle actin).

As indicated above, even if the cells of the subject invention originate from the same cell population or cell type as those of the '914 and '094 patents (*i.e.*, the same starting material), the applicant respectfully submits that the cells of the invention are novel and non-obvious over the cited patents because the cells of the invention exhibit a characteristic that is not possessed by the pluripotent cells of the cited references, or their differentiated or lineage-committed progeny. Thus, assuming *arguendo* that the cells of the '914 and '094 patents are capable of simultaneously expressing the recited markers, the cited patents do not teach the culture conditions necessary to impart this characteristic to the pluripotent cells or their progeny, *i.e.*, the conditions necessary to induce the pluripotent cells or their progeny to simultaneously express the diverse mesenchymal

lineage-specific markers recited in the claims of the subject application. As the Examiner is aware, a reference does not legally anticipate the claimed subject matter if it is not sufficiently enabling. “For a publication to constitute an anticipation of an invention and, thus, to bar the grant of a patent under 35 U.S.C. 102, it must be capable, when taken in conjunction with the knowledge of those skilled in the art to which it pertains, of placing that invention in the possession of the public”. *Ex parte Humphreys*, 24 USPQ2d 1255, 1261-62 (B.P.A.I. 1992), as set forth in *In re Donohue*, 207 USPQ 196 (C.C.P.A. 1980).

In regard to the comments at page 4 of the Office Action concerning claims 71, 72, 81, 82, 97, and 98, it is true that the patentability of a claimed product (*e.g.*, a cell) does not depend on its method of production (*e.g.*, isolation method and/or culture conditions) per se. However, when assessing the patentability of the claims over the prior art, the Examiner is required to consider any structural distinctions that are implied by the steps in the method of production. Thus, the fact that the pluri-differentiated cell of the invention was cultured and isolated from bone marrow by a different process than the cells of the cited patents must be considered in determining whether the isolated cells represent the same cell having the same characteristics, *i.e.*, expressing the same markers under the same conditions, particularly when the cited references are silent as to the characteristic recited in the claims.

The applicant respectfully submits that the cited references do not teach every element of the applicant’s claimed invention and, therefore, do not anticipate the claimed invention. Accordingly, the applicant respectfully requests reconsideration and withdrawal of the rejections under 35 U.S.C. §102(b).

Claims 63-100 have been rejected under 35 U.S.C. §102(e) as being anticipated by Artavanis-Tsakonas *et al.* (U.S. Patent No. 6,149,902) as is evidenced by the Dictionary of Cell Biology. The applicant respectfully submits that the cited reference does not teach or suggest the cells and compositions of the claimed invention.

As indicated above, claims 63-100, as currently amended, recite that the pluri-differentiated mesenchymal progenitor cell simultaneously expresses, at the protein level, a plurality of genes that are markers for multiple cell lineages, wherein each of the markers is specific for a single cell

lineage. The pluripotent mesenchymal stem cells, lineage-committed progenitors, and terminally differentiated mesenchymal cells of the '902 patent do not simultaneously express the recited genes.

The applicant respectfully submits that the Office Action does not establish that the pluri-differentiated cell of the invention and the pluripotent cell '902 patent are identical or substantially identical, or obtained by an identical or substantially identical process, in accordance with the precepts of *In re Best*, 195 USPQ 430, 433 (C.C.P.A. 1977) and MPEP § 2112.01. The '902 patent describes methods for expanding non-terminally differentiated cells, such as the pluripotent mesenchymal stem cells of the '914 and '094 patents, using agonists of Notch function. As indicated above, these pluripotent mesenchymal stem cells are distinct from the cells of the claimed invention.

As indicated at page 12, lines 4-7, of the subject specification, cells that are pluripotent or have "pluri-potential" are undifferentiated cells having the potential to differentiate into discrete mesenchymal tissues. This is consistent with the definition of "pluripotent stem cells" stated in the Dictionary of Cell Biology cited at page 4 of the Office Action, *i.e.*, "capable of differentiating into several final differentiated types" (emphasis added). As indicated at page ES-2, second column, of *Stem Cells: Scientific Progress and Future Research Directions*, which is submitted herewith, "differentiation is the process by which an unspecialized cell (such as a stem cell) becomes specialized into one of the many cells that make up the body" (emphasis added).

In contrast, the "pluri-differentiated" cell of the subject invention is one that co-expresses genes specific for multiple mesenchymal cell lineages. As indicated at page 13, lines 25-31, of the subject specification, and as recited in the claims, these genes are expressed simultaneously. Thus, "using a variety of techniques, applicant has demonstrated that the MPCs co-express multilineage mesenchymal cell phenotypes, and in this respect the multi- or pluri-differentiated MPCs are distinct from the pluri-potential, but undifferentiated, MSCs of Friedenstein cultures ...", as stated at page 16, lines 3-7, of the specification. Thus, pluripotent cells and pluri-differentiated cells are not equivalents. This is consistent with statements made in the '902 patent. For example, at column 5, lines 19-26, the '902 patent states that

mesenchymal progenitor cells are pluripotent cells that respond to specific signals and adopt specific lineages. For example, in response to bone morphogenic factors, mesenchymal progenitor cells adopt a bone forming lineage. For example, in response to injury, mesodermal progenitor cells can migrate to the appropriate site,

multiply and react to local differentiation factors, consequently adopting a distinct differentiation path” (emphasis added).

At column 21, lines 54-62, the ‘902 patent refers to the pluripotent cells of the ‘914 patent, stating that

Caplan *et al.*, 1993, U.S. Pat. No. 5,266,914 describes an exemplary method for isolating mesenchymal stem cells from bone marrow. These isolated marrow stem cells can be used in conjunction with Notch reagents to expand the stem cell population. These expanded cells may then be transplanted into a host where they can differentiate into osteocytes, cartilage, chondocytes, adipocytes, etc., depending on the surrounding microenvironment of the transplant site.

Thus, the Notch reagent-treated cells of the ‘902 patent are induced to differentiate along distinct differentiation pathways, based on the particular differentiation factors to which they are exposed, culminating in a terminally differentiated mesenchymal cell type. In contrast, the pluri-differentiated cells of the invention simultaneously express genes specific for multiple mesenchymal lineages. The ‘902 patent does not demonstrate or suggest that the Notch reagent-treated marrow-derived mesenchymal cells can be induced to simultaneously express a plurality of genes that are specific markers for at least four different mesenchymal cell lineages, such as adipocytes, osteoblasts, fibroblasts, and muscle cells, as is recited in claims 63, 64, 73, 74, 87, and 89, of the subject application.

As indicated above in the applicant’s remarks concerning the rejections under 35 U.S.C. §102(b), inherency may not be established by probabilities or possibilities regarding what may have resulted in the prior art. *In re Oelrich*. “The mere fact that a certain thing may result from a given set of circumstances is not sufficient.” *Hansgirk v. Kemmer*. It is the Examiner’s burden of providing factual evidence and/or technical reasoning to support the determination of inherency. See *In re Spada* and *In re King*. The applicant respectfully submits that the Examiner has not met this burden. There is no teaching in the ‘902 patent, nor has the Examiner shown, that it is a certainty that the Notch reagent-treated pluripotent mesenchymal cells or their lineage-committed progeny simultaneously express a plurality of genes that are markers for multiple cell lineages comprising at least four different mesenchymal cell lineages (such as adipocyte, osteoblast, fibroblast, or muscle), wherein each of the markers is specific for a single cell lineage.

In alleging inherency, the Examiner merely relies on a definition of the term “pluripotent” within the Dictionary of Cell Biology and the fact that the cells of the subject invention and cited references were both obtained from bone marrow. The applicant respectfully submits that the dictionary definition of “pluripotent” provided with the Office Action, which is the only extrinsic evidence provided by the Examiner, is consistent with its use in the specification, and the specification clearly distinguishes “pluripotent” cells from “pluri-differentiated” cells. As indicated above, there are many cell types resident in bone marrow. Thus, the fact that the cell of the invention was obtained from a common source of tissue as the cells of the ‘902 patent is not a basis in fact or technical reasoning that reasonably supports the determination that the cells of the cited patents simultaneously express the recited markers, particularly since the cell of the invention was isolated from bone marrow by a different process than the cells of the ‘902 patent, as the Examiner acknowledges at page 5 of the Office Action. Because the Examiner has not shown that the allegedly inherent characteristic (simultaneous expression of the recited mesenchymal cell lineage-specific markers) necessarily flows from the teachings of the ‘902 patent, the applicant respectfully submits that the cited reference does not anticipate the claimed invention.

Moreover, even if the cells of the subject invention originate from the same cell population or cell type as those of the ‘902 patent (*i.e.*, the same starting material), the applicant respectfully submits that the cells of the invention are novel and non-obvious over the cited patent because the cells of the invention exhibit a characteristic that is not possessed by the pluripotent cells of the cited reference, or their differentiated or lineage-committed progeny. Thus, assuming *arguendo* that the cells of the ‘902 patent are capable of simultaneously expressing the recited markers, the cited patent does not teach the culture conditions necessary to impart this characteristic to the pluripotent cells or their progeny, *i.e.*, the conditions necessary to induce the pluripotent cells or their progeny to simultaneously express the diverse mesenchymal lineage-specific markers recited in the claims of the subject application. As indicated above in the applicant’s remarks concerning the rejections under 35 U.S.C. §102(b), a reference does not legally anticipate the claimed subject matter if it is not sufficiently enabling, placing the invention in the possession of the public.

The applicant respectfully submits that the cited reference does not teach every element of the applicant’s claimed invention and, therefore, does not anticipate the claimed invention. Accordingly,

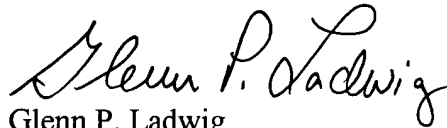
the applicant respectfully requests reconsideration and withdrawal of the rejection under 35 U.S.C. §102(e).

In view of the foregoing remarks and amendments to the claims, the applicant believes that the currently pending claims are in condition for allowance, and such action is respectfully requested.

The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16 or 1.17 as required by this paper to Deposit Account 19-0065.

The applicant invites the Examiner to call the undersigned if clarification is needed on any of this response, or if the Examiner believes a telephonic interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,



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Attachments: Petition and Fee for Extension of Time

Stem Cells: Scientific Progress and Future Research Directions